CLAIMS

We claim:

1. A method that applies to vehicles herein designated as articulated vehicles for continuously monitoring erratic jackknifing, continuously calculating the probability of a roll over of said articulated vehicle due to said erratic jackknifing using any computational technique, and continuously suppressing said erratic jackknifing to prevent said roll over using in part but not exclusively the driver's intention, the road conditions, the said articulated vehicle behavior, and other inputs in a ride control system capable of commanding the brake system among other functions, said articulated vehicle including at least one powered unit located at the front of the said articulated vehicle to provide the power to move the said articulated vehicle and to provide room for the driver, said powered unit is herein designated as tractor, and said articulated vehicle also including at least one trailed unit located at the back of the said articulated vehicle, herein designated as trailer, said trailer including at least one independent antilock brake system that can be operated independently of the said tractor to slow down or to stop the said trailer, said method for monitoring erratic jackknifing, calculating the probability of a roll over of said articulated vehicle and suppressing said erratic jackknifing to prevent said roll over comprising the steps of:

   a) providing the said ride control system with at least the driver's intention, the road conditions, the said articulated vehicle behavior and other inputs when the said articulated vehicle is in motion to determine whether or not erratic jackknifing is underway and determine the instantaneous orientation of the said trailer with respect to the said tractor,

b) using any preferred method of computation to determine the probability of said trailer roll-over based in part but not exclusively on the magnitude of said erratic jackknifing,

c) using any method to slow down the left or right wheels of the said trailer based on the said instantaneous orientation of the said trailer to drag the said trailer on the side and force it to line up with the said tractor.

2. A method as set forth in claim 1 wherein the step of taking the said driver's intention, the said road conditions, the said articulated vehicle behavior and the said other inputs further comprises the steps of:

a) determining a sampling rate for receiving the said driver's intention, the said road conditions, the said articulated vehicle behavior and the said other inputs using any preferred method,

b) translating the said driver's behavior, the said road conditions, the said articulated vehicle behavior and the said other inputs into recordable data using any preferred data format,

c) using the said recordable data to determine the said probability of roll-over using a preferred method,

d) using the said ride control system to activate brakes based in part but not solely on the said probability of roll over,

e) determining a new said orientation of said trailer with respect to the said tractor to verify whether or not said erratic jackknifing has been suppressed.

3. A method as set forth in claim 1 wherein the step of calculating the said probability of roll over of said trailer due to said erratic jackknifing further comprises the steps of:

a) conditioning said recordable data in order to achieve a desirable accuracy of calculation,

b) determining a threshold level to distinguish between low and high probability and determine eminence of said roll over based on a preferred time interval.

4. A method as set forth in claim 1 wherein the step of applying brakes to left or right wheels of said trailer further comprises the steps of:

a) converting said probability of roll over into a transmittable signal when said probability is high,

b) transmitting said transmittable signal to said antilock brake system using a preferred communication mode,

c) commanding said antilock brake system to deliver a certain amount of brake pressure to either left or right wheels of said trailer based in part on said transmittable signal.

5. A structure that applies to vehicles herein designated as articulated vehicles for continuously monitoring erratic jackknifing, continuously calculating the probability of a roll over of said articulated vehicle due to said erratic jackknifing using any computational technique, and continuously suppressing said erratic jackknifing to prevent said roll over using in part but not exclusively the driver's intention, the road conditions, the said articulated vehicle behavior, and other inputs in a ride control system capable of commanding the brake system among other functions, said articulated vehicle including at least one powered unit located at the front of the said articulated vehicle to provide the power to move the said articulated vehicle and to provide room for the driver, said powered unit is herein designated as tractor, and said articulated vehicle also including at least one trailed unit located at the back of the said articulated vehicle,

herein designated as trailer, said trailer including at least one independent antilock brake system that can be operated independently of the said tractor to slow down or to stop the said trailer, said structure for monitoring erratic jackknifing, calculating the probability of a roll over of said articulated vehicle and suppressing said erratic jackknifing to prevent said roll over comprising the steps of:

a) means for providing the said ride control system with at least the driver's intention, the road conditions, the said articulated vehicle behavior and said other inputs when the said articulated vehicle is in motion to determine whether or not erratic jackknifing is underway and determine the instantaneous orientation of the said trailer with respect to the said tractor,

b) means for using any preferred method of computation to determine the probability of said trailer roll-over based in part but not exclusively on the magnitude of said erratic jackknifing,

c) means to slow down the left or right wheels of the said trailer based in part on the said probability of said trailer roll over and the said instantaneous orientation of the said trailer to drag the said trailer on the side and force it to line up with the said tractor.

6. A structure as set forth in claim 5 wherein means for providing the said ride control system with at least the said driver's intention, the said road conditions, the said articulated vehicle behavior and said other inputs further comprises respectively at least one device capable of sensing the displacement of the steering system, at least one device capable of sensing the suspension response to the changes of said road conditions, at least one device capable of sensing the instantaneous position and orientation of the said trailer with respect to the said tractor, and at least one device capable of sensing each of the said other inputs.

7. A structure as set forth in claim 5 wherein a device for calculating the probability of said trailer roll-over based in part but not exclusively on the magnitude of said erratic jackknifing is an electronic device, said electronic device further comprising:

a) at least one threshold crossing detector for setting a required minimum value for said displacement of the steering system, for said suspension response to the changes of said road conditions, for said the instantaneous position and orientation of the said trailer with respect to the said tractor, and for each of the said other inputs,

b) at least one conversion circuit for rescaling the said driver's intention, the said road conditions, the said articulated vehicle behavior and said other inputs to a preferred voltage range to produce voltage signals,

c) at least one range divider for differentiating between a low range and a high range of said voltage signals,

d) at least one gain circuit for specifying variable gain factors to amplify said voltage signals to a required level of said preferred range,

e) a microprocessor for calculating said probability of trailer roll-over based in part but not exclusively on the magnitude of said erratic jackknifing,

f) at least one output circuit that is capable of translating said probability of trailer roll-over into a transmittable signal, whereby said transmittable signal is sent to said anti-lock brake system unit using said preferred communication mode.

8. A structure as set forth in claim 5 wherein a means for slowing down the left or right wheels of the said trailer based in part on the

said probability of said trailer roll over and the said instantaneous orientation of the said trailer further comprises an electronic control unit capable of receiving said transmittable signal and comparing it to a predetermined signal for calculating offset needed to command and control said anti-lock brake system in such a way that the operation of said articulated vehicle is made safe.